

REQUEST FOR PROPOSALS

FEASIBILITY STUDY FOR THE

TURKEY: COAL GASIFICATION PROJECT

Submission Deadline: **4:00 PM**
LOCAL TIME
December 10, 2009

Submission Place: **TURKISH COAL ENTERPRISES**
HIPODROM STREET NO. 12
06330 YENIMAHALLE
ANKARA, TURKEY

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SEALED PROPOSALS SHALL BE CLEARLY MARKED AND RECEIVED PRIOR TO THE TIME AND DATE SPECIFIED ABOVE. PROPOSALS RECEIVED AFTER SAID TIME AND DATE WILL NOT BE ACCEPTED OR CONSIDERED.

REQUEST FOR PROPOSALS

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Section 1: INTRODUCTION

The U.S. Trade and Development Agency (USTDA) has provided a grant in the amount of US\$437,020 to Turkish Coal Enterprises (the "Grantee") in accordance with a grant agreement dated August 27, 2009 (the "Grant Agreement"). The funding provided by the Grant Agreement is to cover the costs of a feasibility study ("Study") whose purpose is to evaluate the technical aspects and economics of a conceptual design for a coal (lignite) gasification project (the "Project"), the implementation of which would enable the production of lignite-derived substitute natural gas (SNG) for use in Turkey's natural gas transmission system. The Grant Agreement is attached at Annex 4 for reference. The Grantee is now soliciting technical proposals from qualified U.S. firms to provide expert consulting services to perform the Study.

1.1 BACKGROUND SUMMARY

In October 2008, USTDA approved funding for the Turkey: Energy Diversification and Efficiency Assessment Mission (Activity No. 2008-81002A), which was a Definitional Mission-type activity that had been expanded in scope to review Turkey's overall energy balance, evaluate a range of options to meet domestic electricity needs, recommend a strategy to diversify the types and sources of fuels used in energy production, recommend methods to improve overall energy efficiency, and identify policy reforms that would encourage more private sector investment in the Turkish energy sector. An additional objective of the Assessment Mission was to recommend further relevant USTDA activities, of which the Study for which proposals are now solicited is one.

Substantial reserves of lignite exist throughout Turkey. Because of its generally low calorific value, most of this lignite is used in electric power plants. However, the possibility of gasifying these lignite resources to produce pipeline-quality gas has a significant potential to increase Turkey's energy self-sufficiency and reduce its vulnerability to natural gas import shocks. Sample tests have indicated that gasification of Turkish lignite is possible. The Study will help determine the technical and economic feasibility of proceeding with lignite gasification on a commercial scale. The Project's eventual location will depend on site, fuel, and climate information, though the Grantee has mentioned the Afsin-Elbistan site in central Turkey as a potential plant location.

The Grantee's production capacity is 45 Million tons/year and ranks as the third largest lignite producer in Europe. The other half is produced by *Elektrik Üretim A.Ş.* (EÜAŞ), a state-owned electricity generating company, which burns lignite in some of its plants. The Grantee was established in 1957 and has mined only lignite since 1983. As of March 2008, it had \$1.47 billion in revenue with approximately 9,000 employees. It operates eight large mining operations, both open pit and underground, and remains government-owned due to the policy that primary energy sources should be in public hands.

A background Definitional Mission report is provided for reference in Annex 2.

1.2 OBJECTIVE

The objective of the Study is to assess the technical, economic and financial feasibility of a lignite gasification facility to produce pipeline-quality SNG for introduction into Turkey's natural gas transmission system. The Terms of Reference (TOR) for this Study are attached at the end on Annex 4.

1.3 PROPOSALS TO BE SUBMITTED

Technical proposals are solicited from interested and qualified U.S. firms. The administrative and technical requirements as detailed throughout the Request for Proposals (RFP) will apply. Specific proposal format and content requirements are detailed in Section 3.

The amount for the contract has been established by a USTDA grant of US\$437,020. **The USTDA grant of \$US437,020 is a fixed amount. Accordingly, COST will not be a factor in the evaluation and therefore, cost proposals should not be submitted.** Upon detailed evaluation of technical proposals, the Grantee shall select one firm for contract negotiations.

1.4 CONTRACT FUNDED BY USTDA

In accordance with the terms and conditions of the Grant Agreement, USTDA has provided a grant in the amount of US\$437,020 to the Grantee. The funding provided under the Grant Agreement shall be used to fund the costs of the contract between the Grantee and the U.S. firm selected by the Grantee to perform the TOR. The contract must include certain USTDA Mandatory Contract Clauses relating to nationality, taxes, payment, reporting, and other matters. The USTDA nationality requirements and the USTDA Mandatory Contract Clauses are attached at Annexes 3 and 4, respectively, for reference.

Section 2: INSTRUCTIONS TO OFFERORS

2.1 PROJECT TITLE

The project is called Turkey: Coal Gasification Project.

2.2 DEFINITIONS

Please note the following definitions of terms as used in this RFP.

The term "Request for Proposals" means this solicitation of a formal technical proposal, including qualifications statement.

The term "Offeror" means the U.S. firm, including any and all subcontractors, which responds to the RFP and submits a formal proposal and which may or may not be successful in being awarded this procurement.

2.3 DEFINITIONAL MISSION REPORT

USTDA sponsored a Definitional Mission to address technical, financial, sociopolitical, environmental and other aspects of the proposed project. A copy of the report is attached at Annex 2 for background information only. Please note that the TOR referenced in the report are included in this RFP at the end on Annex 4.

2.4 EXAMINATION OF DOCUMENTS

Offerors should carefully examine this RFP. It will be assumed that Offerors have done such inspection and that through examinations, inquiries and investigation they have become familiarized with local conditions and the nature of problems to be solved during the execution of the Study.

Offerors shall address all items as specified in this RFP. Failure to adhere to this format may disqualify an Offeror from further consideration.

Submission of a proposal shall constitute evidence that the Offeror has made all the above mentioned examinations and investigations, and is free of any uncertainty with respect to conditions which would affect the execution and completion of the Study.

2.5 PROJECT FUNDING SOURCE

The Study will be funded under a grant from USTDA. The total amount of the grant is not to exceed US\$437,020.

2.6 RESPONSIBILITY FOR COSTS

Offeror shall be fully responsible for all costs incurred in the development and submission of the proposal. Neither USTDA nor the Grantee assumes any obligation as a result of the issuance of this RFP, the preparation or submission of a proposal by an Offeror, the evaluation of proposals, final selection or negotiation of a contract.

2.7 TAXES

Offerors should submit proposals that note that in accordance with the USTDA Mandatory Contract Clauses, USTDA grant funds shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in the Host Country. Offerors shall be fully responsible for such taxes, tariffs, duties, fees or other levies including taxes or stamp duty arising out of the execution of a contract with the Grantee, if applicable. Neither USTDA nor the Grantee assumes any liability for such taxes, duties, fees or other levies.

2.8 CONFIDENTIALITY

The Grantee will preserve the confidentiality of any business proprietary or confidential information submitted by the Offeror, which is clearly designated as such by the Offeror, to the extent permitted by the laws of the Host Country.

All information disclosed (whether disclosed orally, in writing, in electronic form or by any other means) by the Grantee to the Offeror for the purposes of the Study shall be treated by the Offeror as confidential information and shall not be disclosed or divulged by the Offeror to any third party without the prior written approval of the Grantee. The Offeror shall not use any such information for purposes other than the purpose for which it is supplied. The Offeror may disclose any confidential information to its employees or sub-contractors only for the purposes of the Study. The Offeror shall ensure that its employees or sub-contractors are also bound by the terms of the confidentiality provided herein.

All reports, technical analysis, feasibility study or other works prepared by the Offeror regarding the Study are dedicated to the use of the Grantee. The Offeror shall agree, acknowledge and undertake that the proprietary of such documentation belongs to the Grantee and the Offeror shall not use such documentation for purposes other than the purposes of the contract during the term of the contract and following the termination or expiration thereof. It shall also not claim any rights on such documentation during the term of or following the termination or expiration of the contract.

Notwithstanding any of the provisions set forth above in this Clause 2.8, no provision of this Clause 2.8 affects in any way (i) the selected Offeror's obligation to provide to USTDA the complete Final Report referenced in Clause I of the USTDA Mandatory Contract Clauses contained in Annex II to the Grant Agreement, or (ii) the right of USTDA to use that Final Report. As provided in Clause I of the USTDA Mandatory Contract Clauses, if the selected Offeror clearly marks information in the complete version of the Final Report as confidential, USTDA will maintain the confidentiality of such information in accordance with applicable law.

2.9 ECONOMY OF PROPOSALS

Proposal documents should be prepared simply and economically, providing a comprehensive yet concise description of the Offeror's capabilities to satisfy the requirements of the RFP. Emphasis should be placed on completeness and clarity of content.

2.10 OFFEROR CERTIFICATIONS

The Offeror shall certify (a) that its proposal is genuine and is not made in the interest of, or on behalf of, any undisclosed person, firm, or corporation, and is not submitted in conformity with, and agreement of, any undisclosed group, association, organization, or corporation; (b) that it has not directly or indirectly induced or solicited any other Offeror to put in a false proposal; (c) that it has not solicited or induced any other person, firm, or corporation to refrain from submitting a proposal; (d) that it has not sought by collusion to obtain for itself any advantage over any other Offeror or over the Grantee or USTDA or any employee thereof; and (e) that it has all the requisite corporate power and authority to submit this proposal.

2.11 CONDITIONS REQUIRED FOR PARTICIPATION

Only U.S. firms are eligible to participate in this tender. However, U.S. firms may utilize subcontractors from the Host Country for up to 20 percent of the amount of the USTDA grant for specific services from the TOR identified in the subcontract. USTDA's nationality requirements, including definitions, are detailed in Annex 3.

2.12 LANGUAGE OF PROPOSAL

All proposal documents shall be prepared and submitted in English, and only English.

2.13 PROPOSAL SUBMISSION REQUIREMENTS

The **Cover Letter** in the proposal must be addressed to:

**Dr. Selahaddin ANAÇ
TURKISH COAL ENTERPRISES
HIPODROM STREET NO. 12
06330 YENIMAHALLE
ANKARA, TURKEY**

**TEL.: +90 312 384 1600
FAX: +90 312 384 1612**

One (1) original and eight (8) copies of your proposal must be received at the above address no later than 4:30 PM LOCAL TIME, on December 10, 2009.

Proposals may be either sent by mail, overnight courier, or hand-delivered. Whether the proposal is sent by mail, courier or hand-delivered, the Offeror shall be responsible for actual delivery of the proposal to the above address before the deadline. Any proposal received after the deadline will be returned unopened. The Grantee will promptly notify any Offeror if its proposal was received late.

Upon timely receipt, all proposals become the property of the Grantee.

2.14 PACKAGING

The original and each copy of the proposal must be sealed to ensure confidentiality of the information. The proposals should be individually wrapped and sealed, and labeled for content including "original" or "copy number x"; the original and eight (8) copies should be collectively wrapped and sealed, and clearly labeled.

Neither USTDA nor the Grantee will be responsible for premature opening of proposals not properly wrapped, sealed and labeled.

2.15 AUTHORIZED SIGNATURE

The proposal must contain the signature of a duly authorized officer or agent of the Offeror empowered with the right to bind the Offeror. A notarized document evidencing the signing authority of the person who signed the proposal should be submitted with the proposal.

2.16 EFFECTIVE PERIOD OF PROPOSAL

The proposal shall be binding upon the Offeror for NINETY (90) days after the proposal due date, and Offeror may withdraw or modify this proposal at any time prior to the due date upon written request, signed in the same manner and by the same person who signed the original proposal.

2.17 EXCEPTIONS

All Offerors agree by their response to this RFP announcement to abide by the procedures set forth herein. No exceptions shall be permitted.

2.18 OFFEROR QUALIFICATIONS

As provided in Section 3, Offerors shall submit evidence that they have relevant past experience and have previously delivered advisory, feasibility study and/or other services similar to those required in the TOR, as applicable.

2.19 RIGHT TO REJECT PROPOSALS

The Grantee reserves the right to reject any and all proposals.

2.20 PRIME CONTRACTOR RESPONSIBILITY

Offerors have the option of subcontracting parts of the services they propose. The Offeror's proposal must include a description of any anticipated subcontracting arrangements, including the name, address, and qualifications of any subcontractors. USTDA nationality provisions apply to the use of subcontractors and are set forth in detail in Annex 3. The successful Offeror shall cause appropriate provisions of its contract, including all of the applicable USTDA Mandatory Contract Clauses, to be inserted in any subcontract funded or partially funded by USTDA grant funds. The Offeror shall also ensure that any subcontract contain similar confidentiality terms as provided for the Offeror herein and in its contract.

2.21 AWARD

The Grantee shall make an award resulting from this RFP to the best qualified Offeror, on the basis of the evaluation factors set forth herein. The Grantee reserves the right to reject any and all proposals received and, in all cases, the Grantee will be the judge as to whether a proposal has or has not satisfactorily met the requirements of this RFP. If the Grantee rejects all proposals, a new tender process shall be pursued in accordance with the provisions herein.

2.22 COMPLETE SERVICES

The successful Offeror shall be required to (a) provide local transportation, office space and secretarial support required to perform the TOR if such support is not provided by the Grantee; (b) provide and perform all necessary labor, supervision and services; and (c) in accordance with best technical and business practice, and in accordance with the requirements, stipulations, provisions and conditions of this RFP and the resultant contract, execute and complete the TOR to the satisfaction of the Grantee and USTDA.

2.23 INVOICING AND PAYMENT

Deliverables under the contract shall be delivered on a schedule to be agreed upon in a contract with the Grantee. The Contractor may submit invoices to the designated Grantee Project Director in accordance with a schedule to be negotiated and included in the contract. The Grantee shall have a right not to accept any work delivered if it does not comply with or contain any of the specifications contained in the contract. After the Grantee's approval of each work deliverable and each invoice, the Grantee will forward the invoice to USTDA. If all of the requirements of USTDA's Mandatory Contract Clauses are met, USTDA shall make its respective disbursement of the grant funds directly to the U.S. firm in the United States. All payments by USTDA under the Grant Agreement will be made in U.S. currency. Detailed provisions with respect to invoicing and disbursement of grant funds are set forth in the USTDA Mandatory Contract Clauses attached in Annex 4.

Section 3: PROPOSAL FORMAT AND CONTENT

To expedite proposal review and evaluation, and to assure that each proposal receives the same orderly review, all proposals must follow the format described in this section.

Proposal sections and pages shall be appropriately numbered and the proposal shall include a Table of Contents. Offerors are encouraged to submit concise and clear responses to the RFP. Proposals shall contain all elements of information requested without exception. Instructions regarding the required scope and content are given in this section. The Grantee reserves the right to include any part of the selected proposal in the final contract.

The proposal shall consist of a technical proposal only. A cost proposal is NOT required because the amount for the contract has been established by a USTDA grant of US\$437,020, which is a fixed amount.

Offerors shall submit one (1) original and eight (8) copies of the proposal. Proposals received by fax cannot be accepted.

Each proposal must include the following:

- Transmittal Letter,
- Cover/Title Page,
- Table of Contents,
- Executive Summary,
- Company Information,
- Organizational Structure, Management Plan, and Key Personnel,
- Technical Approach and Work Plan, and
- Experience and Qualifications.

Detailed requirements and directions for the preparation of the proposal are presented below.

3.1 EXECUTIVE SUMMARY

An Executive Summary should be prepared describing the major elements of the proposal, including any conclusions, assumptions, and general recommendations the Offeror desires to make. Offerors are requested to make every effort to limit the length of the Executive Summary to no more than five (5) pages.

3.2 COMPANY INFORMATION

For convenience, the information required in this Section 3.2 may be submitted in the form attached in Annex 5 hereto.

3.2.1 Company Profile

Provide the information listed below relative to the Offeror's firm. If the Offeror is proposing to subcontract some of the proposed work to another firm(s), the information below must be provided for each subcontractor.

1. Name of firm and business address (street address only), including telephone and fax numbers.
2. Year established (include predecessor companies and year(s) established, if appropriate).
3. Type of ownership (e.g. public, private or closely held).
4. If private or closely held company, provide list of shareholders and the percentage of their ownership.
5. List of directors and principal officers (President, Chief Executive Officer, Vice-President(s), Secretary and Treasurer; provide full names including first, middle and last). Please place an asterisk (*) next to the names of those principal officers who will be involved in the Study.
6. If Offeror is a subsidiary, indicate if Offeror is a wholly-owned or partially-owned subsidiary. Provide the information requested in items 1 through 5 above for the Offeror's parent(s).
7. Project Manager's name, address, telephone number, e-mail address and fax number.

3.2.2 Offeror's Authorized Negotiator

Provide name, title, address, telephone number, e-mail address and fax number of the Offeror's authorized negotiator. The person cited shall be empowered to make binding commitments for the Offeror and its subcontractors, if any.

3.2.3 Negotiation Prerequisites

1. Discuss any current or anticipated commitments which may impact the ability of the Offeror or its subcontractors to complete the Study as proposed and reflect such impact within the project schedule.
2. Identify any specific information which is needed from the Grantee before commencing contract negotiations.

3.2.4 Offeror's Representations

If the Offeror is proposing to subcontract some of the proposed work to another firm(s), the representations below should be made by each subcontractor as well. If any of the following representations cannot be made, or if there are exceptions, the Offeror must provide an explanation.

1. Company is a corporation *[insert applicable type of entity if not a corporation]* duly organized, validly existing and in good standing under the laws of the State of _____. The Company has all the requisite corporate power and authority to conduct its business as presently conducted, to submit this proposal, and if selected, to execute and deliver a contract to the Grantee for the performance of the Feasibility Study. The Company is not debarred, suspended, or to the best of its knowledge or belief, proposed for debarment or ineligible for the award of contracts by any federal or state governmental agency or authority. The Company is properly licensed, equipped, competent and qualified to perform the Feasibility Study in accordance with the terms herein.
2. The Company has included herewith, a certified copy of its Articles of Incorporation and a certificate of good standing issued within one month of the date of signature below by the State of _____, and a notarized document evidencing the signing authority of the person who signed the proposal. The Company commits to notify USTDA and the Grantee if they become aware of any change in their status in the state in which they are incorporated. USTDA and the Grantee retain the right to request an updated certificate of good standing.
3. Neither the Company nor any of its principal officers have, within the three-year period preceding the submission of this proposal, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a federal, state or local government contract or subcontract; violation of federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, violating federal or state criminal tax laws, or receiving stolen property.
4. Neither the Company, nor any of its principal officers, is presently indicted for, or otherwise criminally or civilly charged with, commission of any of the offenses enumerated in paragraph 2 above.
5. There are no federal or state tax liens pending against the assets, property or business of the Company. The Company, has not, within the three-year period preceding the submission of this proposal, been notified of any delinquent federal or state taxes in an amount that exceeds \$3,000 for which the liability remains unsatisfied. Taxes are considered delinquent if (a) the tax liability has been fully determined, with no pending administrative or judicial appeals; and (b) a taxpayer has failed to pay the tax liability when full payment is due and required.

6. The Company has not commenced a voluntary case or other proceeding seeking liquidation, reorganization or other relief with respect to itself or its debts under any bankruptcy, insolvency or other similar law. The Company has not had filed against it an involuntary petition under any bankruptcy, insolvency or similar law. The selected Company shall notify the Grantee and USTDA if any of the representations included in its proposal are no longer true and correct at the time of its entry into a contract with the Grantee.
7. The Company is not a party to any legal, administrative, arbitral, investigatory or other proceeding or controversy pending or threatened that would adversely affect its ability to perform its obligations herein.

The selected Offeror shall notify the Grantee and USTDA if any of the representations included in its proposal are no longer true and correct at the time of its entry into a contract with the Grantee. USTDA and the Grantee retain the right to request an updated certificate of good standing from the selected Offeror.

3.3 ORGANIZATIONAL STRUCTURE, MANAGEMENT, AND KEY PERSONNEL

Describe the Offeror's proposed project organizational structure. Discuss how the project will be managed including the principal and key staff assignments for this Study. Identify the Project Manager who will be the individual responsible for this project. The Project Manager shall have the responsibility and authority to act on behalf of the Offeror in all matters related to the Study.

Provide a listing of personnel (including subcontractors) to be engaged in the project, including both U.S. and local subcontractors, with the following information for key staff: position in the project; pertinent experience, curriculum vitae; other relevant information. If subcontractors are to be used, the Offeror shall describe the organizational relationship, if any, between the Offeror and the subcontractor.

A manpower schedule and the level of effort for the project period, by activities and tasks, as detailed under the Technical Approach and Work Plan shall be submitted. A statement confirming the availability of the proposed project manager and key staff over the duration of the project must be included in the proposal.

3.4 TECHNICAL APPROACH AND WORK PLAN

Describe in detail the proposed Technical Approach and Work Plan (the "Work Plan"). Discuss the Offeror's methodology for completing the project requirements. Include a brief narrative of the Offeror's methodology for completing the tasks within each activity series. Begin with the information gathering phase and continue through delivery and approval of all required reports.

Prepare a detailed schedule of performance that describes all activities and tasks within the Work Plan, including periodic reporting or review points, incremental delivery dates, and other project milestones.

Based on the Work Plan, and previous project experience, describe any support that the Offeror will require from the Grantee. Detail the amount of staff time required by the Grantee or other participating agencies and any work space or facilities needed to complete the Study.

3.5 SECTION 5: EXPERIENCE AND QUALIFICATIONS

Provide a discussion of the Offeror's experience and qualifications that are relevant to the objectives and TOR for the Study. If a subcontractor(s) is being used, similar information must be provided for the prime and each subcontractor firm proposed for the project. The Offeror shall provide information with respect to relevant experience and qualifications of key staff proposed. The Offeror shall include letters of commitment from the individuals proposed confirming their availability for contract performance.

As many as possible but not more than six (6) relevant and verifiable project references must be provided for each of the Offeror and any subcontractor, including the following information:

- Project name,
- Name and address of client (indicate if joint venture),
- Client contact person (name/ position/ current phone and fax numbers),
- Period of Contract,
- Description of services provided,
- Dollar amount of Contract, and
- Status and comments.

Offerors are strongly encouraged to include in their experience summary primarily those projects that are similar to or larger in scope than the Study as described in this RFP.

Section 4: AWARD CRITERIA

Individual proposals will be initially evaluated by a Procurement Selection Committee of representatives from the Grantee. The Committee will then conduct a final evaluation and completion of ranking of qualified Offerors. The Grantee will notify USTDA of the best qualified Offeror, and upon receipt of USTDA's no-objection letter, the Grantee shall promptly notify all Offerors of the award and negotiate a contract with the best qualified Offeror. USTDA can only give an objection letter with a reasonable ground. In such case, USTDA shall explain its grounds to object in the objection letter.. If a satisfactory contract cannot be negotiated with the best qualified Offeror, negotiations will be formally terminated. Negotiations may then be undertaken with the second most qualified Offeror and so forth.

The selection of the Contractor will be based on the following criteria:

- First hand design knowledge in coal gasification (40 points)
- Experience in engineering feasibility studies of this type (35 points)
- Experience conducting economic and financial analysis, and developing business plans (10 points)
- Experience in Turkey (10 points)
- Turkish language capabilities (5 points)

Competitive Offerors will have as members of their Study work teams a project manager, chemical engineer, mechanical engineer, civil engineer, instrumentation and controls engineer, cost estimator, a financial analyst, and an environmental engineer.

Proposals that do not include all requested information may be considered non-responsive.

Price will not be a factor in contractor selection.

The Grantee reserves the right to contract with the Contractor for subsequent work related to the Project.

ANNEX 1

PROPOSAL EVALUATION COMMITTEE, TURKISH COAL ENTERPRISES,
HIPODROM STREET NO. 12, 06330 YENIMAHALLE
ANKARA, TURKEY; TEL.: +90 312 384 1683; FAX: +90 312 384 6234

CODE R - TURKEY COAL GASIFICATION PROJECT

POC: John Kusnierek, USTDA, 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357, Fax: (703) 875-4009. TURKEY COAL GASIFICATION PROJECT. The Grantee invites submission of qualifications and proposal data (collectively referred to as the "Proposal") from interested U.S. firms that are qualified on the basis of experience and capability to develop a feasibility study to evaluate the technical aspects and economics of a conceptual design for a coal (lignite) gasification project, the implementation of which would enable the production of lignite-derived substitute natural gas (SNG) for use in Turkey's natural gas transmission system.

In October 2008, USTDA approved funding for the Turkey: Energy Diversification and Efficiency Assessment Mission (Activity No. 2008-81002A), to review Turkey's overall energy balance, evaluate a range of options to meet domestic electricity needs, recommend a strategy to diversify the types and sources of fuels used in energy production, recommend methods to improve overall energy efficiency, and identify policy reforms that would encourage more private sector investment in the Turkish energy sector. An additional objective of the Assessment Mission was to recommend further relevant USTDA activities, of which the study for which proposals are now solicited is one.

Substantial reserves of lignite exist throughout Turkey. Because of its generally low calorific value, most of this lignite is used in electric power plants. However, the possibility of gasifying these lignite resources to produce pipeline-quality gas has a significant potential to increase Turkey's energy self-sufficiency and reduce its vulnerability to natural gas import shocks. Sample tests have indicated that gasification of Turkish lignite is possible. The study will help determine the technical and economic feasibility of proceeding with lignite gasification on a commercial scale. The Project's eventual location will depend on site, fuel, and climate information, though the Grantee has mentioned the Afsin-Elbistan site in central Turkey as a potential plant location.

The Grantee produces about half of the lignite mined in Turkey and ranks as the third largest lignite producer in Europe. The other half is produced by Elektrik Uretim A.Ş. (EÜAŞ), a state-owned electricity generating company, which burns lignite in some of its plants. The Grantee was established in 1987 and has mined only lignite since 1993. As of March 2008, it had \$1 billion in revenue with approximately 12,000 employees. It operates eight large mining operations, both open pit and underground, and remains government-owned due to the policy that primary energy sources should be in public hands.

The objective of the study is to assess the technical, economic and financial feasibility of a lignite gasification facility to produce pipeline-quality SNG for introduction into Turkey's natural gas transmission system. The study includes technical, financial, economic and environmental analyses.

The U.S. firm selected will be paid in U.S. dollars from a \$437,020 grant to the Grantee from the U.S. Trade and Development Agency (USTDA).

A detailed Request for Proposals (RFP), which includes requirements for the Proposal, the Terms of Reference, and a background definitional mission/desk study report are available from USTDA, at 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901. To request the RFP in PDF format, please go to:

<https://www.ustda.gov/USTDA/FedBizOpps/RFP/rfpform.asp>. Requests for a mailed hardcopy version of the RFP may also be faxed to the IRC, USTDA at 703-875-4009. In the fax, please include your firm's name, contact person, address, and telephone number. Some firms have found that RFP materials sent by U.S. mail do not reach them in time for preparation of an adequate response. Firms that want USTDA to use an overnight delivery service should include the name of the delivery service and your firm's account number in the request for the RFP. Firms that want to send a courier to USTDA to retrieve the RFP should allow one hour after faxing the request to USTDA before scheduling a pick-up. Please note that no telephone requests for the RFP will be honored. Please check your internal fax verification receipt. Because of the large number of RFP requests, USTDA cannot respond to requests for fax verification. Requests for RFPs received before 4:00 PM will be mailed the same day. Requests received after 4:00 PM will be mailed the following day. Please check with your courier and/or mail room before calling USTDA.

Only U.S. firms and individuals may bid on this USTDA financed activity. Interested firms, their subcontractors and employees of all participants must qualify under USTDA's nationality requirements as of the due date for submission of qualifications and proposals and, if selected to carry out the USTDA-financed activity, must continue to meet such requirements throughout the duration of the USTDA-financed activity. All goods and services to be provided by the selected firm shall have their nationality, source and origin in the U.S. or host country. The U.S. firm may use subcontractors from the host country for up to 20 percent of the USTDA grant amount. Details of USTDA's nationality requirements and mandatory contract clauses are also included in the RFP.

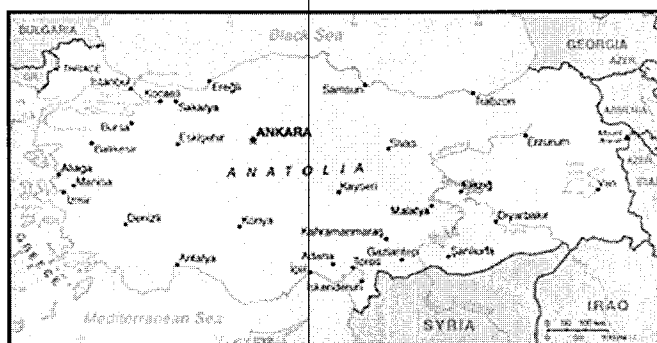
Interested U.S. firms should submit their Proposal in English directly to the Grantee by 4:00 PM LOCAL TIME on DECEMBER 10, 2009 at the above address. Evaluation criteria for the Proposal are included in the RFP. Price will not be a factor in contractor selection, and therefore, cost proposals should NOT be submitted. The Grantee reserves the right to reject any and/or all Proposals. The Grantee also reserves the right to contract with the selected firm for subsequent work related to the project. The Grantee is not bound to pay for any costs associated with the preparation and submission of Proposals.

ANNEX 2

A complete version of this report is available from USTDA's Library; when requesting the report please reference USTDA Activity No. 200981002A.



Turkey: Energy Diversification And Efficiency Projects Assessment Mission



Final Report, July 22, 2009



This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U.S. Government. The opinions, findings, conclusions, or recommendations expressed in this document are those of the author(s) and do not necessarily represent the official position or policies of USTDA. USTDA makes no representation about, nor does it accept responsibility for, the accuracy or completeness of the information contained in this report.

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This Assessment Mission was carried out by an Energy Markets Group Team based on project identification work carried out in Ankara and Istanbul from January 11 – 17, 2009. The Team consisted of James B. Sullivan, Project Leader, Claude Eggleton, and Charles Moseley, all of EMG. Stratos Tavoulareas of Entec participated as well. The Team was accompanied in all or in part by Daniel Stein of USTDA, Serdar Cetinkaya of the U.S. Foreign Commercial Service, Ronald Benioff of the USDOE National Renewable Energy Laboratory, Scott Smouse of the USDOE National Energy Technology Laboratory, and Michael Cohen of USDOE. Any errors or omissions in this report are solely the responsibility of Dr. Sullivan, the primary author of this report.

SECTION 1: OVERVIEW OF THE CURRENT STATE OF TURKEY'S ENERGY SECTOR

1.1 EXECUTIVE SUMMARY OF THE OVERVIEW

Turkey is overly reliant on energy imports: By 2008, Turkey's energy consumption exceeded 100 million tonnes of oil equivalent (TOE¹), more than 100% increase from the 1990 level. Over the last few decades, dependence on oil has declined to approximately 35%, but demand for natural gas demand has grown ten-fold since 1990, reaching 25% share of total primary energy consumption. The share of coal is roughly 25%, down from 32% in 1990 and the share of combustible renewables and wastes 7%, down from 14% in 1990.

Turkey has substantial coal/lignite reserves, as well as renewable resources—hydro, geothermal, wind, solar and biomass—that have only been partially exploited. Turkey has a significant energy efficiency potential that is yet to be realized. Oil and natural gas are almost non-existent and the country relies on imports.

Since most of Turkey's gas is coming from only one source (Russia), it has increased the energy vulnerability of the country. This dependency on gas and the need to reduce its carbon intensity are the key motivations for Turkey's efforts to diversify its energy resources and reduce the carbon footprint of its energy sector.

Turkey faces electricity shortages in 2011 and beyond: In spite of some serious setbacks in recent years (the severe Marmara earthquake and the banking crisis in 2001), Turkey's economy has grown at a resilient pace; for example, GDP grew at an average 6.9% over the period 2002-07. In 2008, the overall GDP growth was approximately 2.3%; in the first half of 2008, GDP grew by 4.0-6.3% but in the second half the growth was reduced to 0.5%². During meetings between IMF and the Turkish Central Bank on January 16-17, 2009, it was reported that the GDP growth for 2009 had been revised to 1.0% (from the previous 4% official forecast). In December 2008, the World Bank (Economic Prospects) was forecasting 1.7% and The Economist projected 0.4% in its January 31, 2009 issue. Considering that predictions are lagging actual economic activity, it is likely that the 2009/10 forecasts will be revised further downward. However, the consensus is that long-term economic growth will resume at a similar pace as the recent past. As a result, the most likely GDP growth will be 0.0-1.0% during the period 2009/10³ and 5.5% after 2011⁴.

The assessment of the EMG team is that the government's electricity demand forecasts are reasonable for the post-2011 period. For 2009/10, electricity demand is likely to expand by zero to 1.3%, instead of 6.4% projected by the government⁵. An actual contraction of the demand remains possible if economic activity falls short of the most recent forecasts.

¹ Standard of the International Energy Agency (IEA): 1 metric tonne of oil equivalent = 11,630 kilowatt hours.

² Turkish Central Bank, Hurriyet, Jan 17-18, 2009

³ Predictions of the authors (Tavoulareas) based on recent announcements and analyses

⁴ TEIAS, "Turkish Electrical Energy/10-year Generation Capacity Projection (2008-2017)

⁵ TEIAS

A consensus of analyses is that, ignoring the impact of the current financial crisis, there would have been a lack of adequate capacity and electric energy as early as this year (2009) or in 2010. This is based on the observation that a minimum 15% reserve margin is needed for safe power system operation. Also, there is not much excess energy supply in 2009/10, especially if firm power capacity is taken into account. Considering the impact of the financial crisis, it is virtually certain that Turkey will not experience a power supply problem earlier than 2011. However, if planned projects do not materialize as scheduled, lack of adequate electric supply could become a problem as early as 2011-2012.

Long-term demand for imported gas will continue to rise. Turkey's gas demand forecasts are reasonable based on the information presently available. The residential demand is not very elastic and depends mainly on the expansion of the gas distribution network in new cities. The industrial demand for gas may be affected by the financial downturn for the next couple of years (2009/10), but long-term demand is likely to follow historical trends.

Turkey faces a number of significant energy sector issues. Interviews with energy leaders in Turkey raised a number of significant issues regarding Turkey's energy future:

- Turkey's pace of reform in the energy sector is proceeding too slowly to provide sufficient incentive to allow the level needed of private sector investment in electricity generation and distribution.
- Broader economic issues continue to hinder foreign direct investment in Turkey's energy sector.
- Reliance on natural gas from Russia has increased substantially during recent years; reduce reliance on one source is of strategic important and will have to be achieved by diversifying gas supply sources and reducing the amount of gas consumed.
- Despite the good legislative and regulatory framework created by the 2001 Electricity Market Law, the establishment of EMRA, and the 2004 Electricity Strategy, not much competition has developed
- There is a significant gap in energy efficiency financing in Turkey. Energy efficiency has yet to become a priority for the Turkish private sector.

Section 2 of this report includes seven projects that have been selected to be consistent with the above issues and to be of strategic value to Turkey.

PROJECT #4: FEASIBILITY OF LIGNITE GASIFICATION

PURPOSE

In January 2009 meetings with Turkish Coal Enterprises (TKİ) the Assessment Mission (AM) team identified strong interest in assistance from USTDA in exploring the feasibility of gasifying Turkey's lignite coal to substitute for natural gas that is now imported. This project will support that interest.

BACKGROUND

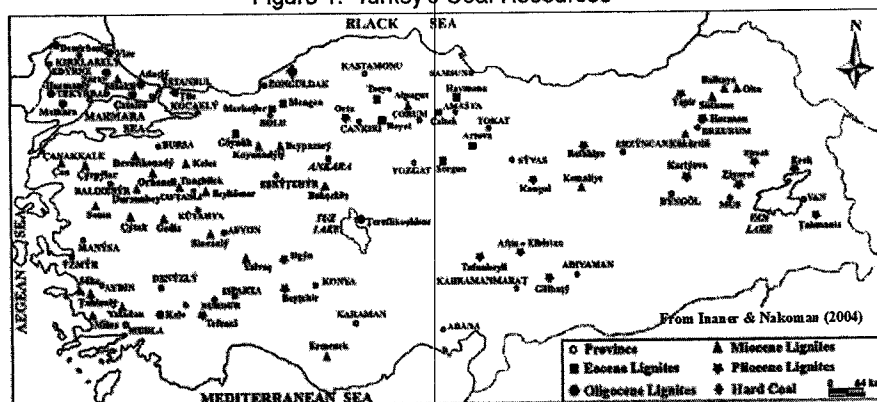
Turkey is heavily reliant on energy imports to grow its economy: In 2008, Turkey's energy consumption exceeded 100 million tonnes of oil equivalent (TOE), an increase of more than 100% from the 1990 level. Over the last few decades, dependence on oil has declined to approximately 35%, but demand for natural gas has grown tenfold since 1990, reaching 25% share of total primary energy consumption. The share of coal is roughly 25%, which is down from 32% in 1990, and the share of combustible renewables and wastes now 7%, which is down from 14% in 1990.

Since most of Turkey's natural gas is from only one source (Russia), the country's energy supply is becoming more vulnerable as its imports increase. This dependency on gas and the need to reduce its carbon intensity, with its application to accede to the European Union, are key motivations for Turkey's efforts to diversify its energy resources.

Turkey has substantial coal/lignite reserves, as well as renewable resources, that have not been fully exploited. The possibility of gasifying its lignite resources, in order to produce pipeline quality gas, has a significant potential to increase Turkey's energy self-sufficiency and reduce its vulnerability to foreign imports of energy.

Turkey's lignite resource: Lignite is Turkey's most abundant domestic energy source. According to data from the U.S. Geological Survey (USGS) and from the Turkish government, lignite occurs in the Eocene, Oligocene, Miocene, and Pliocene basins all around Turkey. The majority of Turkish lignite deposits (68%) are worked in open-pit mines with the total lignite coal reserve estimated to be around 8.3 billion tonnes (by 2001 estimates), of which 3.4 billion tonnes are in the Afsin-Elbistan area.

Figure 1. Turkey's Coal Resources

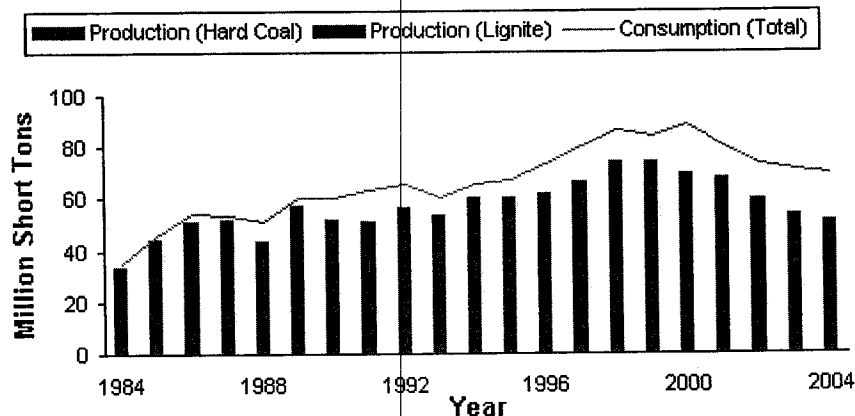


Of the 8.3 billion tonne resource, 3.9 billion tonnes are minable, 68% by surface mining. Two-thirds of these reserves have very low calorific values of only about 1,100 kcal/kg (1,986 Btu/lb); the calorific value of the other third varies from 2,000-4,000 kcal/kg (3,611-7,222 Btu/lb). High-quality bituminous coals around the world will typically have calorific values exceeding about 5,540 kcal/kg (10,000 Btu/lb). The best lignite mined has a calorific value of 5,500 kcal/kg (9,930 Btu/lb). The low calorific value of Turkish lignite is often coupled with high sulphur and ash content, which is somewhat unusual for other lignite around the world. Most of the lignite produced in Turkey is used in mine-mouth electrical power plants, because of the low calorific values.

Lignite is mined by TKI (Turkish Coal Enterprises) at a rate of 60-65 million short tons (Mmst) per year. Figure 2 shows coal production and consumption for 1984-2004. Production and consumption of coal and lignite reached a peak around 2000 and has been declining since. In 2004, Turkey produced 51 Mmst of total coal, of which 94 percent was lignite. Turkey consumed about 70 Mmst of total primary coal in 2004, showing net imports of approximately 19 Mmst. The situation has not changed substantially since 2004, even though more coal imports are planned in the future.

Figure 2: Turkey's Coal Production and Consumption from 1984-2004

Turkey's Coal Production and Consumption, 1984-2004



Source: EIA International Energy Annual

Status of commercialization of lignite gasification technology worldwide: Gasification is a commercially available technology to utilize low-ash coals (bituminous and subbituminous); entrained gasification is suitable for these coals. Worldwide, there are 144 operating plants with 427 gasifiers, representing a total capacity equivalent to 56 Gigawatts-thermal (GWth). Fifty-five percent of the plants in operation use coal and 33 percent use petroleum residues. Taken together, these plants produce 45 chemicals, 30 percent syngas (used for production of ammonia, fertilizers, and other chemicals), and 19 percent power. Large integrated gasification combined cycle (IGCC) power plants (200-500 megawatts [MW] each) are currently in operation in Demkolec in the Netherlands, Wabash and Tampa in the United States, Puertollano in Spain, and Japan.

For high-ash coals, the suitable technology is fluidized bed gasification technology. The largest fluidized bed gasifiers are U-Gas type (offered by Gas Technology Institute [GTI]), which are designed to process 150 tons of coal per day and currently operate in China. All other fluidized bed gasification technologies are still in pilot stages: KRW (Kellogg Rust Westinghouse) at 15 tpd and KBR (Kellogg Brown and Root) Transport at 65 tpd. Based on this, scaleup to a 100-MW IGCC plant is considered to be the next step for fluidized bed gasification technology. The KBR transport gasifier, now known as the Transport Reactor Integrated Gasification - TRIG™ technology, has been developed by Southern Company at the Power Systems Development Facility (PSDF) in Wilsonville, Alabama, with support from the U.S. Department of Energy's (DOE) Gasification Program. Studies completed by DOE and Southern Company have shown that the transport gasifier is projected to be the lowest capital cost, coal-based power generation option, while providing the lowest cost of electricity and excellent environmental performance. The technology is now being scaled up to 582 MW under DOE's Clean Coal Power Initiative (CCPI), Technology, to use lignite by a team consisting of Southern Company Services, Mississippi Power Company, and Kellogg Brown & Root, LLC, in Kemper County, Mississippi. Also, dry-feed slagging gasifiers (e.g., Siemens) have demonstrated solid operational results with high-ash lignite coal.

PROJECT DESCRIPTION

This project will assess the technical, economic, and financial feasibility of a gasification system to provide substitute natural gas (SNG) into Turkey's gas transmission system.

The gasification section of the plant will consist of equipment components for lignite receiving, handling and storage, lignite drying and size reduction, dry lignite pressurization and feeding, fluid bed gasification, ash removal and handling, and raw syngas heat recovery. These components have been utilized commercially in large-scale plants for power and chemical production applications. While there is no large-scale experience with fluid bed lignite gasification, pilot testing has been successfully completed with high-ash coals and lignite, and there are no technical feasibility issues that will hinder the success scale-up to SNG-capacity gasifiers. Conventional syngas cleaning processes and methanation technologies are commercially available and can be applied to lignite-based syngas to reliably produce SNG.

Currently, the only operating coal-to-SNG plant in the United States is the Dakota Gasification Company's Great Plains Synfuels Plant, which has successfully operated for several decades. This plant converts North Dakota lignite coal to 100 million cubic feet (MMCF) per day of pipeline-quality SNG using seven British Lurgi gasifiers. In recent years, plans for a number of lignite-to-gas plants have been announced in the United States, but none of these have been financed¹⁹ yet.

PROJECT LOCATION

The project's eventual location and use for the gas depends on site, fuel, and climate information that will be provided by Türkiye Kömür İşletmeleri Kurumu (TKİ).

SPONSOR'S CAPABILITIES AND COMMITMENT

TKİ, the state-owned lignite mining company, has requested this study. It produces about half of the lignite mined in Turkey and ranks as the third largest lignite producer in Europe. (The other half is produced by EÜAŞ for power generation.) TKİ was established in 1987 and has mined only lignite since 1993. As of March 2008, TKİ had \$1 billion in revenue with approximately 12,000 employees. It operates eight large mining operations, both open pit and underground. TKİ remains government owned, due to the policy that primary energy sources should be in public hands.

TKİ has publicly committed to exploring coal-to-liquid and coal-to-gas technologies and to working closely with the United States. TKİ apparently has the track record and the technical capacity to sponsoring a gasification plant. If such a plant were to be used to feed a gas turbine for power generation, TKİ would undoubtedly team up with EÜAŞ.

POTENTIAL OBSTACLES

The main problem for lignite gasification to generate electric power (via IGCC) is its high capital cost. DOE's National Energy Technology Laboratory (NETL) provides estimates of \$1,841/kW installed capacity (2007 dollars) versus \$1,562/kW for a conventional pulverized coal plant. There have also been some questions about IGCC reliability. The Wabash River Plant in the United States was repeatedly down due to gasifier problems, although it has reportedly been running reliably over the past year. The former Chevron Texaco gasification technology, now owned by General Electric (GE), was deployed at the Tampa Electric Company's (TECO) Polk IGCC Plant. This plant has shown high availability, and has been the first unit dispatched by TECO, due to the plant's ability to fire a range of fuels, including low-cost petroleum coke. GE is currently designing an IGCC model plant that should introduce greater reliability. GE's model features advanced turbines optimized for the coal syngas. Eastman's industrial gasification plant in Kingsport, Tennessee, uses a GE Energy solid-fed gasifier. Eastman, a Fortune 500 company, built the facility in 1983 without state or Federal subsidies and

¹⁹ The reason behind the lack of finance for these plants has to do with, among other things, the relative price of gasification as an energy source as compared with natural gas prices.

turns a profit. The proven GE gasification technology, however, may be unsuitable for Turkish lignite due to its current use of a slurry feed system. However, GE has acquired the Stamet dry solids feed pump technology and is planning to soon demonstrate this technology at full scale.

The main obstacles associated with IGCC for lignite are: (1) the suitable gasification process (fluidized bed gasification) is still in a pre-commercial stage; (2) hence, there are technology-related risks; and (3) capital costs are high compared to conventional power generation options using lignite, making it relatively difficult to finance IGCC projects.

As mentioned above, fluidized bed gasification is still in the demonstration stage. Therefore, implementation of IGCC projects carry some technology-related risks, such as the potential that the IGCC plant will have lower performance than designed for (including plant efficiency, auxiliary power, and emissions) and lower reliability due to frequent failures. While these risks can be managed, they may incur additional costs. Also, capital costs of IGCC plants are generally 10-40% higher than similar plants utilizing pulverized coal technology; as such, they are difficult to finance.

IMPLEMENTATION FINANCING

The Assessment Mission team assumes that the first gasification project will be a demonstration plant implemented by the public sector and financed out of appropriated funds. The economics portion of this feasibility study will analyze the cost of the energy produced, based on dollars per million Btus or some similar measure.

RISKS

The table below summarizes the main risks associated with a lignite gasification project and the potential mitigation strategies that may result from the proposed facility and subsequent activities.

Table 1: Risks Associated with a Lignite Gasification Project and Potential Mitigation Strategies

Category	Risk Description	Possible Mitigation Strategy
Project	<ul style="list-style-type: none"> Like any project, there are risks associated with securing a go-ahead decision, corporate approvals and securing priority status in project development. Resource assessments may indicate insufficient potential to sustain an economically attractive project. 	<ul style="list-style-type: none"> Completion of a sound and thorough study will provide momentum for the project. Lignite test samples and test burns of samples from various locations can mitigate against uncertainty in capability of gasification technology to handle Turkish lignite.
Operational	<ul style="list-style-type: none"> Lack of experience in operating gasifier technology could lead to failures. Performance and reliability are below design levels. 	<ul style="list-style-type: none"> Careful planning and sufficient training will lessen risk due to unknown technology processes. Adequate budget contingency is provided to address performance and reliability problems.

Commercial	<ul style="list-style-type: none"> • Uncertainties in the regulatory regime such as tariffs, taxes, and others could undermine the financial feasibility of the project. • May not be able to finance the incremental costs (above the conventional technology) either through grants or loans. 	<ul style="list-style-type: none"> • A feasibility study will identify and analyze such risks, which will aid developers in seeking means to reduce or eliminate those uncertainties. • Climate change-related sources of financing will be sought. • Also, the electricity regulator will be encouraged to allow full cost recovery through tariffs.
Political	<ul style="list-style-type: none"> • Lack of regulatory approvals. • Lack of political ability to provide incentives and eliminate disincentives. 	<ul style="list-style-type: none"> • The regulatory issues analysis in the feasibility study will be done in a way to gain participation and later approval of regulators.
Environmental	<ul style="list-style-type: none"> • Low environmental risks are associated with gasification technologies although some environmental groups are opposed to clean coal technologies. 	<ul style="list-style-type: none"> • The feasibility study will identify any potential environmental risks and work with authorities and stakeholders to minimize risks.

CAPITAL COST ESTIMATES

Because no SNG plants have been recently built and the few recently completed studies by private firms have not been made public, it is difficult to estimate the costs for such a plant, especially in Turkey. However, the Great Plains Plant in North Dakota is quite profitable today and competitive with moderately priced natural gas. Also, carbon dioxide (CO₂) from this plant is pipelined into Canada for use in commercial enhanced oil recovery (EOR), creating another high revenue stream. A similar opportunity may exist in a mature oil field in Turkey, which would further reduce dependence on imported fuel. Of course, the Great Plains plant has been subsidized; so, the economic and financial analysis would need to address the viability of the project.

For a lignite to gas plant producing 50 Bscf/yr, NETL estimates the total project costs of a synthetic natural gas (SNG) plant in the United States (North Dakota) to be in the range of \$2.5-3 billion. This estimate comes from reliable expert sources in the U.S. and so can serve as a rough estimate of what a similar plant in Turkey would cost. The AM team cannot refine this number for conditions in Turkey because at this stage of the analysis we lack the needed information on local costs of materials, equipment, and labor.

U.S. EXPORT POTENTIAL

Most gasification technologies suitable for lignite have been developed in the United States. The main suppliers are GTI, KBR, and KRW – all three are U.S. companies. Southern Company has the international rights to the KBR technology. So, the export potential is significant, especially as the gasification technology is refined and more plants are implemented.

Based on the estimate above for the North Dakota plant, the U.S. export potential for the first plants in Turkey is estimated here at US\$1 to 1.5 billion. While much of the plant's civil infrastructure is likely to be sourced locally, or procured from low-cost global

suppliers, most of the plant design and much of the plant equipment and instrumentation & controls could be provided from the United States. Because lignite gasification is a U.S. technology, it can be expected that U.S. companies could capture roughly half of the equipment and services for the first one or two plants. As other competitors enter the market, the U.S. share can be expected to decline to about 20 percent of the plant, mainly the gas turbine, licensing fee for the gasifier and engineering of the plant.

MARKET ENTRY ISSUES

The AM team did not discover any serious market entry issues for U.S. companies developing the lignite gasification market in Turkey. Since this project will most likely be a government-owned and developed project and the government has requested this feasibility study from USTDA, U.S. firms will be in a priority position to provide the first plants..

DEVELOPMENT IMPACT

With respect to the objectives of United States Trade and Development Agency (USTDA) to advance economic development in the host country while also promoting U.S. exports, a lignite gasification project would provide Turkey with a much needed alternative source of gas that can offset imported gas. It can be used domestically to replace direct use of natural gas or to generate electric power now fired by natural gas. In addition, the project could provide much needed electricity to mitigate the shortages forecast for Turkey in 2011 and thereafter. The project would also establish Turkey as an advanced country in its use of innovative technology to generate the energy it needs to support economic growth. Finally, the project would assist the country in its negotiations for accession into the European Union and the requirements to meet environmental standards.

The development of lignite-to-SNG technology in Turkey would be indicative of a serious effort to use existing resources in an innovative and more environmentally-friendly manner, and would exemplify Turkey's practical interest in offsetting energy imports by shoring up domestic energy production. Toward this end, the Grantee has committed publicly to exploring coal-to-gas technologies, and to working closely with the United States. The construction of a lignite-to-SNG facility in Turkey would fulfill all five of USTDA's development impact measures:

Infrastructure – The development of lignite-to-SNG technology in Turkey would require the construction of a new pilot plant, which would set a working example of how the technology could be used and improved upon in the construction of further such plants in the future.

Market-Oriented Reform – By signaling a push to meet more stringent environmental standards, the development of domestic lignite gasification capabilities would provide Turkey with added leverage in its EU accession negotiations. Domestic oversight of lignite-to-SNG operations toward this end would require new and transparent regulation on the part of relevant energy authorities.

Human Capacity Building – A new, lignite gasification plant would require the services of architects, engineers, construction workers, IT professionals and others for planning, implementation, operation and maintenance. Significant opportunities for training and employment of Turkish citizens should be expected as a result.

Technology Transfer and Productivity Improvement – Fluidized bed gasification is a relatively young technology that through the proposed pilot project would develop in Turkey and possibly undergo improvement. Because of the abundance of Turkish lignite, Turkish authorities have a practical interest in lignite-to SNG technologies and in striving to make them more efficient.

Other – If successful, the establishment of a pilot gasification plant in Turkey would serve as a model for the construction of further lignite-to-SNG plants.

ENVIRONMENTAL IMPACT

Any energy project has the potential to negatively impact the environment. The development of a lignite gasification plant poses less of an environmental hazard, however, and actually should reduce the environmental impact of using lignite as an energy source in Turkey. This is because coal gasification is perhaps the cleanest of the “clean coal technologies” that the United States and other countries are exploring to reduce greenhouse gases and other emissions resulting from energy production. According to the Department of Energy, “[Gasification] is one of the cleanest and most versatile ways to extract energy from coal...” Issues may arise because of land use for lignite gasification facilities and would require planning to minimize negative environmental impacts. The environmental requirements of international financial institutions would also have to be taken into account.

IMPACT ON U.S. JOBS

To the extent that the gasification facility uses U.S. equipment and services, it will create U.S. jobs. Given the preliminary state of this project, The AM team has not quantified that impact.

ASSESSMENT TEAM RECOMMENDATION

The Assessment Mission Team recommends this project for funding as it fits USTDA's criteria well.

PROJECT CONTACTS

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ANNEX 3



**U.S. TRADE AND DEVELOPMENT AGENCY
Arlington, VA 22209-2131**

NATIONALITY, SOURCE, AND ORIGIN REQUIREMENTS

The purpose of USTDA's nationality, source, and origin requirements is to assure the maximum practicable participation of American contractors, technology, equipment and materials in the prefeasibility, feasibility, and implementation stages of a project.

USTDA STANDARD RULE (GRANT AGREEMENT STANDARD LANGUAGE):

Except as USTDA may otherwise agree, each of the following provisions shall apply to the delivery of goods and services funded by USTDA under this Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from host country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for implementation of the Study and associated delivery services (e.g. international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g. local lodging, food, and transportation) in host country are not subject to the above restrictions. USTDA will make available further details concerning these standards of eligibility upon request.

NATIONALITY:

1) Rule

Except as USTDA may otherwise agree, the Contractor for USTDA funded activities must be either a U.S. firm or a U.S. individual. Prime contractors may utilize U.S. subcontractors without limitation, but the use of host country subcontractors is limited to 20% of the USTDA grant amount.

2) Application

Accordingly, only a U.S. firm or U.S. individual may submit proposals on USTDA funded activities. Although those proposals may include subcontracting arrangements with host

country firms or individuals for up to 20% of the USTDA grant amount, they may not include subcontracts with third country entities. U.S. firms submitting proposals must ensure that the professional services funded by the USTDA grant, to the extent not subcontracted to host country entities, are supplied by employees of the firm or employees of U.S. subcontractor firms who are U.S. individuals.

Interested U.S. firms and consultants who submit proposals must meet USTDA nationality requirements as of the due date for the submission of proposals and, if selected, must continue to meet such requirements throughout the duration of the USTDA-financed activity. These nationality provisions apply to whatever portion of the Terms of Reference is funded with the USTDA grant.

3) Definitions

A "U.S. individual" is (a) a U.S. citizen, or (b) a non-U.S. citizen lawfully admitted for permanent residence in the U.S. (a green card holder).

A "U.S. firm" is a privately owned firm which is incorporated in the U.S., with its principal place of business in the U.S., and which is either (a) more than 50% owned by U.S. individuals, or (b) has been incorporated in the U.S. for more than three (3) years prior to the issuance date of the request for proposals; has performed similar services in the U.S. for that three (3) year period; employs U.S. citizens in more than half of its permanent full-time positions in the U.S.; and has the existing capability in the U.S. to perform the work in question.

A partnership, organized in the U.S. with its principal place of business in the U.S., may also qualify as a "U.S. firm" as would a joint venture organized or incorporated in the United States consisting entirely of U.S. firms and/or U.S. individuals.

A nonprofit organization, such as an educational institution, foundation, or association may also qualify as a "U.S. firm" if it is incorporated in the United States and managed by a governing body, a majority of whose members are U.S. individuals.

SOURCE AND ORIGIN:

1) Rule

In addition to the nationality requirement stated above, any goods (e.g. equipment and materials) and services related to their shipment (e.g. international transportation and insurance) funded under the USTDA Grant Agreement must have their source and origin in the United States, unless USTDA otherwise agrees. However, necessary purchases of goods and project support services which are unavailable from a U.S. source (e.g. local food, housing and transportation) are eligible without specific USTDA approval.

2) Application

Accordingly, the prime contractor must be able to demonstrate that all goods and services purchased in the host country to carry out the Terms of Reference for a USTDA Grant Agreement that were not of U.S. source and origin were unavailable in the United States.

3) Definitions

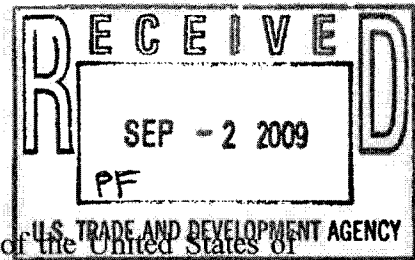
"Source" means the country from which shipment is made.

"Origin" means the place of production, through manufacturing, assembly or otherwise.

Questions regarding these nationality, source and origin requirements may be addressed to the USTDA Office of General Counsel.

ANNEX 4

GRANT AGREEMENT



This Grant Agreement is entered into between the Government of the United States of America, acting through the U.S. Trade and Development Agency ("USTDA") and Türkiye Kömür İşletmeleri Kurumu ("Grantee"). USTDA agrees to provide the Grantee under the terms of this Agreement US\$437,020 ("USTDA Grant") to fund the cost of goods and services required for a feasibility study ("Study") on the proposed Coal Gasification Project ("Project") in Turkey ("Host Country").

PDF:

DS
DH
JM
MB
LZ
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1. USTDA Funding

The funding to be provided under this Grant Agreement shall be used to fund the costs of a contract between the Grantee and the U.S. firm selected by the Grantee ("Contractor") under which the Contractor will perform the Study ("Contract"). Payment to the Contractor will be made directly by USTDA on behalf of the Grantee with the USTDA Grant funds provided under this Grant Agreement.

2. Terms of Reference

The Terms of Reference for the Study ("Terms of Reference") are attached as Annex I and are hereby made a part of this Grant Agreement. The Study will examine the technical, financial, environmental, and other critical aspects of the proposed Project. The Terms of Reference for the Study shall also be included in the Contract.

3. Standards of Conduct

USTDA and the Grantee recognize the existence of standards of conduct for public officials, and commercial entities, in their respective countries. The parties to this Grant Agreement and the Contractor shall observe these standards, which include not accepting payment of money or anything of value, directly or indirectly, from any person for the purpose of illegally or improperly inducing anyone to take any action favorable to any party in connection with the Study.

4. Grantee Responsibilities

The Grantee shall undertake its best efforts to provide reasonable support for the Contractor, such as local transportation, office space, and secretarial support.

Handwritten initials: JM, AB

Handwritten initials: A, B

5. USTDA as Financier

(A) USTDA Approval of Competitive Selection Procedures

Selection of the U.S. Contractor shall be carried out by the Grantee according to its established procedures for the competitive selection of contractors with advance notice of the procurement published online through *Federal Business Opportunities* (www.fedbizopps.gov). Upon request, the Grantee will submit these contracting procedures and related documents to USTDA for information and/or approval.

(B) USTDA Approval of Contractor Selection

The Grantee shall notify USTDA at the address of record set forth in Article 17 below upon selection of the Contractor to perform the Study. Upon approval of this selection by USTDA, the Grantee and the Contractor shall then enter into a contract for performance of the Study. The Grantee shall notify in writing the U.S. firms that submitted unsuccessful proposals to perform the Study that they were not selected.

(C) USTDA Approval of Contract Between Grantee and Contractor

The Grantee and the Contractor shall enter into a contract for performance of the Study. This contract, and any amendments thereto, including assignments and changes in the Terms of Reference, must be approved by USTDA in writing. To expedite this approval, the Grantee (or the Contractor on the Grantee's behalf) shall transmit to USTDA, at the address set forth in Article 17 below, a photocopy of an English language version of the signed contract or a final negotiated draft version of the contract.

(D) USTDA Not a Party to the Contract

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of the contract and any amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of funding the Study and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract or any subcontract, jointly or separately, without thereby incurring any responsibility or liability to such parties. Any approval or failure to approve by USTDA shall not bar the Grantee or USTDA from asserting any right they might have against the



Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Grantee or USTDA.

(E) Grant Agreement Controlling

Regardless of USTDA approval, the rights and obligations of any party to the contract or subcontract thereunder must be consistent with this Grant Agreement. In the event of any inconsistency between the Grant Agreement and any contract or subcontract funded by the Grant Agreement, the Grant Agreement shall be controlling.

6. Disbursement Procedures

(A) USTDA Approval of Contract Required

USTDA will make disbursements of Grant funds directly to the Contractor only after USTDA approves the Grantee's contract with the Contractor.

(B) Contractor Invoice Requirements

The Grantee should request disbursement of funds by USTDA to the Contractor for performance of the Study by submitting invoices in accordance with the procedures set forth in the USTDA Mandatory Clauses in Annex II.

7. Effective Date

The effective date of this Grant Agreement ("Effective Date") shall be the date of signature by both parties or, if the parties sign on different dates, the date of the last signature.

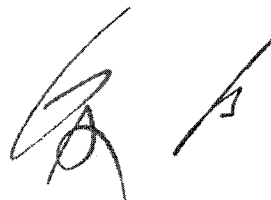
8. Study Schedule

(A) Study Completion Date

The completion date for the Study, which is May 31, 2011, is the date by which the parties estimate that the Study will have been completed.

(B) Time Limitation on Disbursement of USTDA Grant Funds

Except as USTDA may otherwise agree, (a) no USTDA funds may be disbursed under this Grant Agreement for goods and services which are provided prior to the Effective Date of the Grant Agreement; and (b) all funds made available under the Grant Agreement must be disbursed within four (4) years from the Effective Date of the Grant Agreement.



9. USTDA Mandatory Clauses

All contracts funded under this Grant Agreement shall include the USTDA mandatory clauses set forth in Annex II to this Grant Agreement. All subcontracts funded or partially funded with USTDA Grant funds shall include the USTDA mandatory clauses, except for clauses B(1), G, H, I, and J.

10. Use of U.S. Carriers

(A) Air

Transportation by air of persons or property funded under the Grant Agreement shall be on U.S. flag carriers in accordance with the Fly America Act, 49 U.S.C. 40118, to the extent service by such carriers is available, as provided under applicable U.S. Government regulations.

(B) Marine

Transportation by sea of property funded under the Grant Agreement shall be on U.S. carriers in accordance with U.S. cargo preference law.

11. Nationality, Source and Origin

Except as USTDA may otherwise agree, the following provisions shall govern the delivery of goods and services funded by USTDA under the Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from Host Country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for performance of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in Host Country are not subject to the above restrictions. USTDA will make available further details concerning these provisions upon request.

12. Taxes

USTDA funds provided under the Grant Agreement shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in Host Country. Neither the Grantee nor the Contractor will seek reimbursement from USTDA for such taxes, tariffs, duties, fees or other levies.

13. Cooperation Between Parties and Follow-Up

The parties will cooperate to assure that the purposes of the Grant Agreement are accomplished. For five (5) years following receipt by USTDA of the Final Report (as defined in Clause I of Annex II), the Grantee agrees to respond to any reasonable inquiries from USTDA about the status of the Project.

14. Implementation Letters

To assist the Grantee in the implementation of the Study, USTDA may, from time to time, issue implementation letters that will provide additional information about matters covered by the Grant Agreement. The parties may also use jointly agreed upon implementation letters to confirm and record their mutual understanding of matters covered by the Grant Agreement.

15. Recordkeeping and Audit

The Grantee agrees to maintain books, records, and other documents relating to the Study and the Grant Agreement adequate to demonstrate implementation of its responsibilities under the Grant Agreement, including the selection of contractors, receipt and approval of contract deliverables, and approval or disapproval of contractor invoices for payment by USTDA. Such books, records, and other documents shall be separately maintained for three (3) years after the date of the final disbursement by USTDA. The Grantee shall afford USTDA or its authorized representatives the opportunity at reasonable times to review books, records, and other documents relating to the Study and the Grant Agreement.

16. Representation of Parties

For all purposes relevant to the Grant Agreement, the Government of the United States of America will be represented by the U. S. Ambassador to Host Country or USTDA and Grantee will be represented by the General Director. The parties hereto may, by written notice, designate additional representatives for all purposes under the Grant Agreement.

17. Addresses of Record for Parties

Any notice, request, document, or other communication submitted by either party to the other under the Grant Agreement shall be in writing or through a wire or electronic medium which produces a tangible record of the transmission, such as a telegram, cable or facsimile, and will be deemed duly given or sent when delivered to such party at the following:

Handwritten signature and initials, possibly "J.M." and "B.S.", in dark ink.Handwritten signature in dark ink, consisting of a stylized capital letter 'A' followed by a flourish.

To: Turkish Coal Enterprises
Hipodrom Street No.:12 06330 Yenimahalle
Ankara TURKEY
Phone:90 312 384 16 83
Fax: 90 312 384 62 34

To: U.S. Trade and Development Agency
1000 Wilson Boulevard, Suite 1600
Arlington, Virginia 22209-3901
USA

Phone: (703) 875-4357
Fax: (703) 875-4009

All such communications shall be in English, unless the parties otherwise agree in writing. In addition, the Grantee shall provide the Commercial Section of the U.S. Embassy in Host Country with a copy of each communication sent to USTDA.

Any communication relating to this Grant Agreement shall include the following fiscal data:

Appropriation No.: 11 9/10 1001
Activity No.: 2009-81021A
Reservation No.: 2009810023
Grant No.: GH2009810007

18. Termination Clause

Either party may terminate the Grant Agreement by giving the other party thirty (30) days advance written notice. The termination of the Grant Agreement will end any obligations of the parties to provide financial or other resources for the Study, except for payments which they are committed to make pursuant to noncancellable commitments entered into with third parties prior to the written notice of termination.



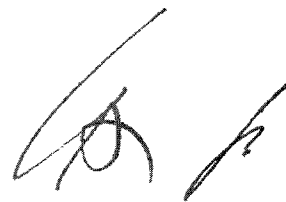
19. Non-waiver of Rights and Remedies

No delay in exercising any right or remedy accruing to either party in connection with the Grant Agreement shall be construed as a waiver of such right or remedy.

20. U.S. Technology and Equipment

By funding this Study, USTDA seeks to promote the project objectives of the Host Country through the use of U.S. technology, goods, and services. In recognition of this purpose, the Grantee agrees that it will allow U.S. suppliers to compete in the procurement of technology, goods and services needed for Project implementation.

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IN WITNESS WHEREOF, the Government of the United States of America and Türkiye Kömür İşletmeleri Kurumu, each acting through its duly authorized representative, have caused this Agreement to be signed in the English language in their names and delivered as of the day and year written below. In the event that this Grant Agreement is signed in more than one language, the English language version shall govern.

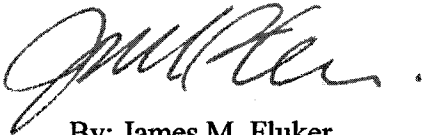
**For the Government of the
United States of America**



By: Douglas A. Silliman
Chargé d'Affaires
U.S. Embassy

Date: August 28, 2009

Witnessed:



By: James M. Fluker
Commercial Counselor
U.S. Embassy

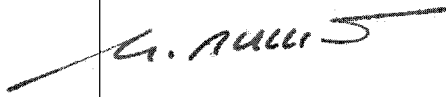
**For
Türkiye Kömür İşletmeleri Kurumu**



By: Dr. Selahaddin Anac
Chairman & Director General
Türkiye Kömür İşletmeleri Kurumu

Date: August 28, 2009

Witnessed:



By: Muammer Bulut
Deputy Director General
Türkiye Kömür İşletmeleri Kurumu

Annex I -- Terms of Reference

Annex II -- USTDA Mandatory Clauses

Annex I

Terms of Reference

This project will assess the technical, economic, and financial feasibility of a gasification system to provide synthetic natural gas (SNG) into the gas transmission system or for use in an IGCC power plant in Turkey.

The Contractor shall complete the following tasks:

Task 1: Purpose of the Study and Preliminary Review

- 1.1 The Contractor shall prepare a concise statement describing the purpose and objective of the Study.
- 1.2 The Contractor shall briefly describe the circumstances that gave rise to the planned development of the Project.
- 1.3 The Contractor shall acquire and compile Turkish national and regional profile information pertinent to the planning and implementation of the Project, including, but not limited to, information on geography, economy, energy use, and government.
- 1.4 The Contractor shall make a preliminary site visit to at least 1 coal field site in Turkey to scope field investigations, to confirm project issues and previously compiled data and to finalize with project stakeholders the approach, schedule, and responsibility assignments for each project partner.

Deliverable: Inception Report: The Contractor shall produce a report covering all work performed under this task, in addition to documentation of Team communications, correspondence, and findings covering this phase of work, as well as the preparation of preliminary project design issues to be examined during remaining tasks and site visits.

Task 2: Technical Analysis

The Contractor shall: (1) screen at least two commercial gasification systems to best meet future demand in Turkey; (2) perform a screening of at least two sites identified in the preliminary site visit to choose the best locations to build these gasification facilities; and (3) carryout a conceptual design of the gasification facility.

This feasibility study will be made at a conceptual level of design, and will be based in part on information available to the Contractor from previous work. Local customization (design and costs) will be prepared by Contractor personnel familiar with local conditions in Turkey.

- 2.1 **Technology Screening Evaluation:** The gasifier study will commence with a screening-level evaluation of all currently available gasification technologies. A review of the Gas Technology Institute report/test results and comment on the suitability of Turkish lignite for U-Gas and other gasification processes will be



Annex I-1

made by the Contractor. The screening evaluation will create several recommendations for next steps. This evaluation will utilize available data, and will detail the following:

- Number of units currently in commercial service
- An estimate of capital cost for an installation with a SNG production capacity of 7,500 million Btu/hr
- An estimate of operating costs on an annual basis
- Availability
- Fuel applicability, including applicability of Turkish coal to each gasifier
- Outage projections, scheduled and unscheduled
- Expected air emissions, and liquid and solid effluents
- Name of suppliers, with discussion of typical scope of supply, type of contract, battery limits
- Pre-FEED evaluation
- A factored estimate of the incremental costs (capital and O&M) for SNG production

2.2 Site Selection: The Contractor shall undertake a site selection study and consider at least two and up to 10 potential sites. A ranking will be made of the sites to include, but not be limited to:

- Land area, geology, topography
- Geology adequate for CO₂ sequestration
- Water availability
- Emissions limitations
- Waste disposal
- Noise
- Transportation and infrastructure
- Distance to natural gas pipelines
- Labor availability
- Security
- Capital expense and operating expense

2.3 Conceptual Design: The Contractor shall perform a concept level evaluation of the selected gasifier and selected site, both of which will be selected in consultation with the Grantee. The gasification technology shall be evaluated by the Contractor in a straight syngas production configuration, without integration of the air separation with the air compressor of the gas turbines. The Contractor's evaluations shall include the following:

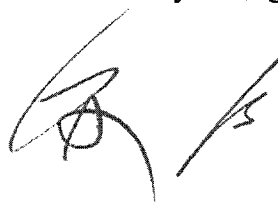
- Design requirements document, which defines the design basis for the feasibility design.
- Technical description of the gasifier and the gas cleanup train, at a conceptual feasibility level of design.
- Equipment list, including major items of equipment, indicating quantities and level of redundancy.
- Heat and mass balance at a single design ambient condition. The work shall be performed by adapting existing software models (heat and mass balances)

where they exist from previous work, or developing new models where required. Following development and examination of the software thermal performance models, a capital and operating cost evaluation will be made for each case by the Contractor. A block flow diagram for the gasifier and gas cleanup train shall also be included, along with the following:

- Thermal performance summary, including tabulation of major auxiliary loads.
- Air emissions summary.
- Plant inputs and outputs summary, including fuel(s), sorbents, co-products (sulfuric acid), and consumables (ammonia, etc.).
- Water balance diagram.
- Conceptual level general arrangement drawings (process blocks) in a plan view.
- Level 1 schedules for engineering, permitting, fabrication and construction, start-up, and commissioning.
- Estimated availability trend for the gasification unit taken from public data. A qualitative discussion of availability of the subsystem level shall be provided.
- Discussion of the treatment and disposition of tars and oils, and butane/toluene, and xylene (BTX), if appropriate.

Task 3: Economic Analysis

- 3.1 The Contractor shall acquire and compile historical and projected energy and capacity information in Turkey for use in assessing the market for energy generated by the gasification facility.
- 3.2 Capital Cost Estimate: After completion of Task 2, a preliminary estimate of the cost for the project shall be made. The Contractor shall provide a capital cost estimate with a detailed breakdown of the costs that will be incurred to bring the project to successful commissioning including:
 - A factored capital cost estimate, typically prepared in a format derived from the Electric Power Research Institute (EPRI) Technical Assessment Guide (TAG).
 - A factored operating cost estimate, including fuels, consumables, parts and labor, and credits for co-products such as sulfuric acid.
 - A qualitative analysis of the economics of scale for syngas plants will be provided.
- 3.3 Project Operating and Maintenance Expenses: The Contractor shall provide an estimate of projected operating expenses including a detailed breakdown of the general, administrative, operating, and maintenance costs for the project. Escalation of the expenses over a two- (2) to five- (5) year period will be taken into consideration depending on the nature of the expenses and the point in the life of the project at which they are incurred.
- 3.4 Projected Revenue: The Contractor shall estimate the projected revenue of the facility plant, including a model of the energy sales of the project over time. Projections shall be based on the tariff applicable to the project, or a best estimate of what that tariff may be.
- 3.5 Cash Balance *Pro Forma*: The Contractor shall develop a cash balance *pro forma* that presents the net cash flow from the Project, determined by netting revenue



against expenses. Expenses will include the administrative, operation, and maintenance expenses as well as debt service.

Task 4: Financial Analysis

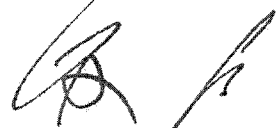
- 4.1 The Contractor shall prepare a financial analysis and model of the project, considering alternative methods and sources of financing, including grants and concessionary financing, equity, and debt. The financial model will be a tool for defining the terms and conditions of the financing structure and testing the volatility of the project's ability to service its debt. Assuming a reasonable debt-equity structure, or a range of debt-equity structures, the Contractor shall calculate the internal rate of return (or rates of return) to equity investors. Following discussion with Grantee, an optimum, minimum, and most likely economic/financial scenario shall be selected by the Contractor to develop financial documentation that may be used by the Grantee for presentation to potential investors and to financial lending institutions. This documentation shall be included in the Final Report.
- 4.2 The Contractor shall calculate the value of the carbon credits that will result from the facility. The Contractor shall also integrate the cost benefits from the sale of these credits into the project's financial and economic projections.
- 4.3 The Contractor shall identify project risk factors and develop a risk avoidance/reduction plan for each factor by means of insurance and bonding or other means, adequate to the requirements of the funding sources, including host country sources, multilateral financiers, and others.
- 4.4 The Contractor shall identify potential funding sources for the gasification project.

Task 5: Environmental Analysis

- 5.1 The Contractor shall evaluate and report on the expected environmental impacts of the project with reference to local, national and international laws and regulations, including those of international finance institutions (e.g., the World Bank, Asian Development Bank, private banks). This review will identify potential negative impacts and discuss the extent to which they can be mitigated. The Contractor shall compare the environmental impact of implementing this gasification project with the impact of using lignite for direct combustion to generate electricity, using practices normally followed in Turkey.

Task 6: Regulatory Analysis

- 6.1 The Contractor shall analyze all regulatory issues that will impact the lignite gasification facility's development. The analysis shall include all pertinent documents that deal with import taxes, duties and fees, corporate and personal income taxes, and property and other taxes related to the implementation of the project. It shall also include all permitting requirements, foreign participation regulations, regulations that impact fuel supply, gas offtake, environmental



requirements and any other regulatory issue that will have a significant impact on the project.

Task 7: Development Impact

7.1 The Contractor shall analyze and report on the potential development impact of the gasification facility. The Contractor shall focus on what the economic development outcomes will be if the project is implemented according to the recommendations of the study. While specific focus should be paid to the immediate impact of the project, the Contractor shall include any additional developmental benefits resulting from the project, including spin-off and demonstration effects. The Contractor shall develop a methodology for assessing these impacts over time, and shall identify where to obtain this information in the future (e.g., Türkiye Kömür İşletmeleri Kurumu (TKİ), Government of Turkey, the U.S. Embassy in Ankara, etc). Specifically, the Contractor shall provide estimates of the project's benefits in the areas of:

- 7.1.1 infrastructure;
- 7.1.2 market-oriented reforms;
- 7.1.3 human capacity building;
- 7.1.4 technology transfer and productivity enhancement;
- 7.1.5 any other benefits that may result from the project.

Task 8: Export Potential--U.S. Sources of Supply

8.1 The Contractor shall determine U.S. export potential related to the implementation of the Project. The Contractor shall tabulate goods and services available from U.S. sources including estimated values and shall list U.S. companies capable of delivering such goods and services.

Task 9: Implementation Plan

- 9.1 The Contractor shall describe the Grantee's institutional structure and management plan for the project. The Contractor shall outline documentation, contracts and agreements necessary to implement the project.
- 9.2 The Contractor shall assess any training needed in TKİ or other government agencies necessary to develop and manage this gasification facility, and identify any additional training of stakeholders that will be required to successfully develop the project.

Task 10: Final Report

The Contractor shall prepare and deliver to the Grantee and USTDA a substantive and comprehensive final report of all work performed under these Terms of Reference ("Final Report"). The Final Report shall be organized according to the above tasks, and shall include all deliverables and documents that have been provided to the Grantee. The Final

Report shall contain an executive summary and shall identify prospective U.S. Sources of Supply for implementation of the project. The Final Report shall be prepared in accordance with Clause I of Annex II of the Grant Agreement.

Notes:

- (1) The Contractor is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.**
- (2) The Contractor and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.**
- (3) The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.**

Annex II

USTDA Mandatory Contract Clauses

A. USTDA Mandatory Clauses Controlling

The parties to this contract acknowledge that this contract is funded in whole or in part by the U.S. Trade and Development Agency ("USTDA") under the Grant Agreement between the Government of the United States of America acting through USTDA and Türkiye Kömür İşletmeleri Kurumu ("Client"), dated _____ ("Grant Agreement"). The Client has selected _____ ("Contractor") to perform the feasibility study ("Study") for the Coal Gasification project ("Project") in Turkey ("Host Country"). Notwithstanding any other provisions of this contract, the following USTDA mandatory contract clauses shall govern. All subcontracts entered into by Contractor funded or partially funded with USTDA Grant funds shall include these USTDA mandatory contract clauses, except for clauses B(1), G, H, I, and J. In addition, in the event of any inconsistency between the Grant Agreement and any contract or subcontract thereunder, the Grant Agreement shall be controlling.

B. USTDA as Financier

(1) USTDA Approval of Contract

All contracts funded under the Grant Agreement, and any amendments thereto, including assignments and changes in the Terms of Reference, must be approved by USTDA in writing in order to be effective with respect to the expenditure of USTDA Grant funds. USTDA will not authorize the disbursement of USTDA Grant funds until the contract has been formally approved by USTDA or until the contract conforms to modifications required by USTDA during the contract review process.

(2) USTDA Not a Party to the Contract

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of this contract and amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of financing the Study and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract or any subcontract, jointly or separately, without thereby incurring any responsibility or liability to such parties. Any approval or failure to approve by USTDA shall not

bar the Client or USTDA from asserting any right they might have against the Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Client or USTDA.

C. Nationality, Source and Origin

Except as USTDA may otherwise agree, the following provisions shall govern the delivery of goods and services funded by USTDA under the Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from Host Country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for performance of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in Host Country are not subject to the above restrictions. USTDA will make available further details concerning these provisions upon request.

D. Recordkeeping and Audit

The Contractor and subcontractors funded under the Grant Agreement shall maintain, in accordance with generally accepted accounting procedures, books, records, and other documents, sufficient to reflect properly all transactions under or in connection with the contract. These books, records, and other documents shall clearly identify and track the use and expenditure of USTDA funds, separately from other funding sources. Such books, records, and documents shall be maintained during the contract term and for a period of three (3) years after final disbursement by USTDA. The Contractor and subcontractors shall afford USTDA, or its authorized representatives, the opportunity at reasonable times for inspection and audit of such books, records, and other documentation.

E. U.S. Carriers

(1) Air

Transportation by air of persons or property funded under the Grant Agreement shall be on U.S. flag carriers in accordance with the Fly America Act, 49 U.S.C. 40118, to the extent service by such carriers is available, as provided under applicable U.S. Government regulations.

(2) Marine

Annex II-2

Transportation by sea of property funded under the Grant Agreement shall be on U.S. carriers in accordance with U.S. cargo preference law.

F. Workman's Compensation Insurance

The Contractor shall provide adequate Workman's Compensation Insurance coverage for work performed under this Contract.

G. Reporting Requirements

The Contractor shall advise USTDA by letter as to the status of the Project on March 1st annually for a period of two (2) years after completion of the Study. In addition, if at any time the Contractor receives follow-on work from the Client, the Contractor shall so notify USTDA and designate the Contractor's contact point including name, telephone, and fax number. Since this information may be made publicly available by USTDA, any information which is confidential shall be designated as such by the Contractor and provided separately to USTDA. USTDA will maintain the confidentiality of such information in accordance with applicable law.

H. Disbursement Procedures

(1) USTDA Approval of Contract

Disbursement of Grant funds will be made only after USTDA approval of this contract. To make this review in a timely fashion, USTDA must receive from either the Client or the Contractor a photocopy of an English language version of a signed contract or a final negotiated draft version to the attention of the General Counsel's office at USTDA's address listed in Clause M below.

(2) Payment Schedule Requirements

A payment schedule for disbursement of Grant funds to the Contractor shall be included in this Contract. Such payment schedule must conform to the following USTDA requirements: (1) up to twenty percent (20%) of the total USTDA Grant amount may be used as a mobilization payment; (2) all other payments, with the exception of the final payment, shall be based upon contract performance milestones; and (3) the final payment may be no less than fifteen percent (15%) of the total USTDA Grant amount, payable upon receipt by USTDA of an approved Final Report in accordance with the specifications and quantities set forth in Clause I below. Invoicing procedures for all payments are described below.

(3) Contractor Invoice Requirements

USTDA will make all disbursements of USTDA Grant funds directly to the Contractor. The Contractor must provide USTDA with an ACH Vendor Enrollment Form (available from USTDA) with the first invoice. The Client shall request disbursement of funds by

 Annex II-3

USTDA to the Contractor for performance of the contract by submitting the following to USTDA:

(a) Contractor's Invoice

The Contractor's invoice shall include reference to an item listed in the Contract payment schedule, the requested payment amount, and an appropriate certification by the Contractor, as follows:

(i) For a mobilization payment (if any):

"As a condition for this mobilization payment, the Contractor certifies that it will perform all work in accordance with the terms of its Contract with the Client. To the extent that the Contractor does not comply with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA. "

(ii) For contract performance milestone payments:

"The Contractor has performed the work described in this invoice in accordance with the terms of its contract with the Client and is entitled to payment thereunder. To the extent the Contractor has not complied with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA."

(iii) For final payment:

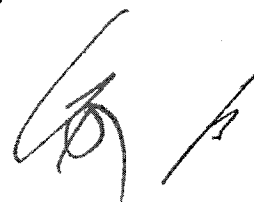
"The Contractor has performed the work described in this invoice in accordance with the terms of its contract with the Client and is entitled to payment thereunder. Specifically, the Contractor has submitted the Final Report to the Client, as required by the Contract, and received the Client's approval of the Final Report. To the extent the Contractor has not complied with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA."

(b) Client's Approval of the Contractor's Invoice

(i) The invoice for a mobilization payment must be approved in writing by the Client.

(ii) For contract performance milestone payments, the following certification by the Client must be provided on the invoice or separately:

"The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract provisions and the terms and conditions of the USTDA Grant Agreement."



(iii) For final payment, the following certification by the Client must be provided on the invoice or separately:

"The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract provisions and terms and conditions of the USTDA Grant Agreement. The Final Report submitted by the Contractor has been reviewed and approved by the Client. "

(c) USTDA Address for Disbursement Requests

Requests for disbursement shall be submitted by courier or mail to the attention of the Finance Department at USTDA's address listed in Clause M below.

(4) Termination

In the event that the Contract is terminated prior to completion, the Contractor will be eligible, subject to USTDA approval, for reasonable and documented costs which have been incurred in performing the Terms of Reference prior to termination, as well as reasonable wind down expenses. Reimbursement for such costs shall not exceed the total amount of undisbursed Grant funds. Likewise, in the event of such termination, USTDA is entitled to receive from the Contractor all USTDA Grant funds previously disbursed to the Contractor (including but not limited to mobilization payments) which exceed the reasonable and documented costs incurred in performing the Terms of Reference prior to termination.

I. USTDA Final Report


(1) Definition

"Final Report" shall mean the Final Report described in the attached Annex I Terms of Reference or, if no such "Final Report" is described therein, "Final Report" shall mean a substantive and comprehensive report of work performed in accordance with the attached Annex I Terms of Reference, including any documents delivered to the Client.

(2) Final Report Submission Requirements

The Contractor shall provide the following to USTDA:

- (a) One (1) complete version of the Final Report for USTDA's records. This version shall have been approved by the Client in writing and must be in the English language. It is the responsibility of the Contractor to ensure that confidential information, if any, contained in this version be clearly marked. USTDA will maintain the confidentiality of such information in accordance with applicable law.

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and

(b) One (1) copy of the Final Report suitable for public distribution ("Public Version"). The Public Version shall have been approved by the Client in writing and must be in the English language. As this version will be available for public distribution, it must not contain any confidential information. If the report in (a) above contains no confidential information, it may be used as the Public Version. In any event, the Public Version must be informative and contain sufficient Project detail to be useful to prospective equipment and service providers.

and

(c) Two (2) CD-ROMs, each containing a complete copy of the Public Version of the Final Report. The electronic files on the CD-ROMs shall be submitted in a commonly accessible read-only format. As these CD-ROMs will be available for public distribution, they must not contain any confidential information. It is the responsibility of the Contractor to ensure that no confidential information is contained on the CD-ROMs.

The Contractor shall also provide one (1) copy of the Public Version of the Final Report to the Foreign Commercial Service Officer or the Economic Section of the U.S. Embassy in Host Country for informational purposes.

(3) Final Report Presentation

All Final Reports submitted to USTDA must be paginated and include the following:

(a) The front cover of every Final Report shall contain the name of the Client, the name of the Contractor who prepared the report, a report title, USTDA's logo, USTDA's mailing and delivery addresses. If the complete version of the Final Report contains confidential information, the Contractor shall be responsible for labeling the front cover of that version of the Final Report with the term "Confidential Version." The Contractor shall be responsible for labeling the front cover of the Public Version of the Final Report with the term "Public Version." The front cover of every Final Report shall also contain the following disclaimer:

"This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U. S. Government. The opinions, findings, conclusions or recommendations expressed in this document are those of the author(s) and do not necessarily represent the official position or policies of USTDA. USTDA makes no representation about, nor does it accept responsibility for, the accuracy or completeness of the information contained in this report."

(b) The inside front cover of every Final Report shall contain USTDA's logo, USTDA's mailing and delivery addresses, and USTDA's mission statement.



Camera-ready copy of USTDA Final Report specifications will be available from USTDA upon request.

(c) The Contractor shall affix to the front of the CD-ROM a label identifying the Host Country, USTDA Activity Number, the name of the Client, the name of the Contractor who prepared the report, a report title, and the following language:

"The Contractor certifies that this CD-ROM contains the Public Version of the Final Report and that all contents are suitable for public distribution."

(d) The Contractor and any subcontractors that perform work pursuant to the Grant Agreement must be clearly identified in the Final Report. Business name, point of contact, address, telephone and fax numbers shall be included for Contractor and each subcontractor.

(e) The Final Report, while aiming at optimum specifications and characteristics for the Project, shall identify the availability of prospective U.S. sources of supply. Business name, point of contact, address, telephone and fax numbers shall be included for each commercial source.

(f) The Final Report shall be accompanied by a letter or other notation by the Client which states that the Client approves the Final Report. A certification by the Client to this effect provided on or with the invoice for final payment will meet this requirement.


J. Modifications

All changes, modifications, assignments or amendments to this contract, including the appendices, shall be made only by written agreement by the parties hereto, subject to written USTDA approval.

K. Study Schedule

(1) Study Completion Date

The completion date for the Study, which is May 31, 2011, is the date by which the parties estimate that the Study will have been completed.

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(2) Time Limitation on Disbursement of USTDA Grant Funds

Except as USTDA may otherwise agree, (a) no USTDA funds may be disbursed under this contract for goods and services which are provided prior to the Effective Date of the Grant Agreement; and (b) all funds made available under the Grant Agreement must be disbursed within four (4) years from the Effective Date of the Grant Agreement.

L. Business Practices

The Contractor agrees not to pay, promise to pay, or authorize the payment of any money or anything of value, directly or indirectly, to any person (whether a governmental official or private individual) for the purpose of illegally or improperly inducing anyone to take any action favorable to any party in connection with the Study. The Client agrees not to receive any such payment. The Contractor and the Client agree that each will require that any agent or representative hired to represent them in connection with the Study will comply with this paragraph and all laws which apply to activities and obligations of each party under this Contract, including but not limited to those laws and obligations dealing with improper payments as described above.

M. USTDA Address and Fiscal Data

Any communication with USTDA regarding this Contract shall be sent to the following address and include the fiscal data listed below:

U.S. Trade and Development Agency
1000 Wilson Boulevard, Suite 1600
Arlington, Virginia 22209-3901
USA

Phone: (703) 875-4357
Fax: (703) 875-4009

Fiscal Data:

Appropriation No.:	11 9/10 1001
Activity No.:	2009-81021A
Reservation No.:	2009810023
Grant No.:	GH2009810007

N. Definitions

All capitalized terms not otherwise defined herein shall have the meaning set forth in the Grant Agreement.



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O. Taxes

USTDA funds provided under the Grant Agreement shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in Host Country. Neither the Client nor the Contractor will seek reimbursement from USTDA for such taxes, tariffs, duties, fees or other levies.

A handwritten signature in dark ink, appearing to be a stylized 'J' or 'I' followed by a dot and some additional strokes.A handwritten signature in dark ink, appearing to be a stylized 'C' or 'A' followed by a vertical stroke.

ANNEX 5

COMPANY INFORMATION

A. Company Profile

Provide the information listed below relative to the Offeror's firm. If the Offeror is proposing to subcontract some of the proposed work to another firm(s), the information below must be provided for each subcontractor.

1. Name of firm and business address (street address only), including telephone and fax numbers:
2. Year established (include predecessor companies and year(s) established, if appropriate).
3. Type of ownership (e.g. public, private or closely held).
4. If private or closely held company, provide list of shareholders and the percentage of their ownership.
5. List of directors and principal officers (President, Chief Executive Officer, Vice-President(s), Secretary and Treasurer; provide full names including first, middle and last). Please place an asterisk (*) next to the names of those principal officers who will be involved in the Feasibility Study.
6. If Offeror is a subsidiary, indicate if Offeror is a wholly-owned or partially-owned subsidiary. Provide the information requested in items 1 through 5 above for the Offeror's parent(s).
7. Project Manager's name, address, telephone number, e-mail address and fax number .

B. Offeror's Authorized Negotiator

Provide name, title, address, telephone number, e-mail address and fax number of the Offeror's authorized negotiator. The person cited shall be empowered to make binding commitments for the Offeror and its subcontractors, if any.

C. Negotiation Prerequisites

1. Discuss any current or anticipated commitments which may impact the ability of the Offeror or its subcontractors to complete the Feasibility Study as proposed and reflect such impact within the project schedule.
2. Identify any specific information which is needed from the Grantee before commencing contract negotiations.

D. Offeror's Representations

If the Offeror is proposing to subcontract some of the proposed work to another firm(s), the representations below should be made by each subcontractor as well. Please provide exceptions and/or explanations in the event that any of the following representations cannot be made:

1. Company is a corporation *[insert applicable type of entity if not a corporation]* duly organized, validly existing and in good standing under the laws of the State of _____. The Company has all the requisite corporate power and authority to conduct its business as presently conducted, to submit this proposal, and if selected, to execute and deliver a contract to the Grantee for the performance of the Feasibility Study. The Company is not debarred, suspended, or to the best of its knowledge or belief, proposed for debarment or ineligible for the award of contracts by any federal or state governmental agency or authority. The Company is properly licensed, equipped, competent and qualified to perform the Feasibility Study in accordance with the terms herein.
2. The Company has included herewith, a certified copy of its Articles of Incorporation, a certificate of good standing issued within one month of the date of signature below by the State of _____, and a notarized document evidencing the signing authority of the person who signed the proposal. The Company commits to notify

USTDA and the Grantee if they become aware of any change in their status in the state in which they are incorporated. USTDA and the Grantee retain the right to request an updated certificate of good standing.

3. Neither the Company nor any of its principal officers have, within the three-year period preceding the submission of this proposal, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a federal, state or local government contract or subcontract; violation of federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, violating federal or state criminal tax laws, or receiving stolen property.
4. Neither the Company, nor any of its principal officers, is presently indicted for, or otherwise criminally or civilly charged with, commission of any of the offenses enumerated in paragraph 2 above.
5. There are no federal or state tax liens pending against the assets, property or business of the Company. The Company, has not, within the three-year period preceding the submission of this proposal, been notified of any delinquent federal or state taxes in an amount that exceeds \$3,000 for which the liability remains unsatisfied. Taxes are considered delinquent if (a) the tax liability has been fully determined, with no pending administrative or judicial appeals; and (b) a taxpayer has failed to pay the tax liability when full payment is due and required.
6. The Company has not commenced a voluntary case or other proceeding seeking liquidation, reorganization or other relief with respect to itself or its debts under any bankruptcy, insolvency or other similar law. The Company has not had filed against it an involuntary petition under any bankruptcy, insolvency or similar law. The selected Company shall notify the Grantee and USTDA if any of the representations included in its proposal are no longer true and correct at the time of its entry into a contract with the Grantee.
7. The Company is not a party to any legal, administrative, arbitral, investigatory or other proceeding or controversy pending or threatened that would adversely affect its ability to perform its obligations herein.

The selected Offeror shall notify the Grantee and USTDA if any of the representations included in its proposal are no longer true and correct at the time of its entry into a contract with the Grantee. USTDA and the Grantee retain the right to request an updated certificate of good standing from the selected Offeror.

Signed: _____
(Authorized Representative)

Print Name: _____

Title: _____

Date: _____